BIOMONITORING OF MYCOTOXIN EXPOSURE THROUGH BIOMARKER ANALYSIS: DEOXYNIVALENOL AS A POTENTIAL RISK FOR THE BELGIAN POPULATION?

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The aim of the BIOMYCO study was to assess human mycotoxin exposure based on the direct measurement of urinary biomarkers in samples of the Belgian population. Morning urine of 155 children (3-12 years) and 239 adults (19-65 years) was collected according to a standardised study protocol. These urine samples were analysed for the presence of 33 urinary mycotoxins and their metabolites. Nine out of 33 potential biomarkers were detected whereby deoxynivalenol (DON), DON-glucuronides (DON-GlcA), deepoxy-deoxynivalenol-glucuronide (DOMGlcA), ochratoxin A, citrinin and dihydrocitrinone were the most frequently detected. DON15GlcA was the main urinary metabolite found in 100% of the samples and for the first time DOMGlcA was detected in urine of children. A risk assessment was performed by comparing the estimated dietary intake of DON with its tolerable daily intake (TDI) whereby the dietary intake of DON was estimated using the urinary concentrations. The estimated intake for DON varied between 0.02–25.47 µg/kg.BW/day for children and 0.01–15.65 µg/kg.BW/day for adults. This could imply a health risk as 1 to 74% of the cases exceeded the TDI for DON (depending on the approach applied to calculate the intake). These results are much higher than previous estimations reported in Europe. Differences in exposure could be explained to the different dietary habits between different countries and the higher occurrence of DON in temperate climates. In order to perform more accurate estimations, research needs to be done to collect information about the human metabolism of mycotoxins. Furthermore, a standardized protocol is needed to perform exposure assessments and to calculate the estimated exposure through urinary levels in order to compare different estimates and to evaluate the variability amongst people. In general, risk assessment based on these data indicate a potential concern for a number of individuals whereby young children need special attention because of the relatively higher food intake.

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